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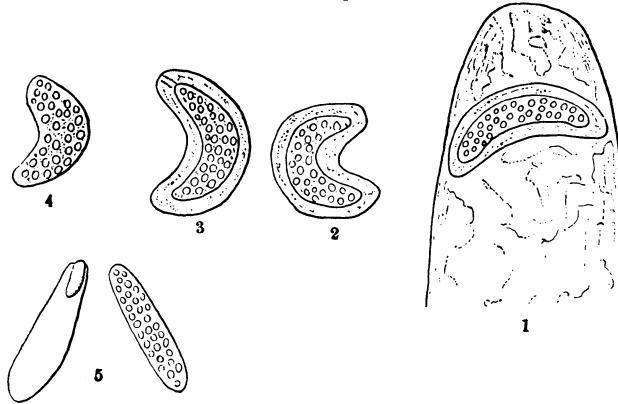
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Notes on Two Parasites of the Cray-Fish.

BY D. S. KELLCOTT, PH. D., F. R. M. S., Buffalo, N. Y.

The cray-fish is a voracious animal, feeding pretty general upon all kinds of fish and flesh, particularly upon worms, mollusks, and insects. It is not critical except as to quantity, hence, in the nature of the case, we should expect it to be infested with an abundance of endo-parasites. After dissecting many examples I have found but two, or, it may be, two stages in the life of one, for both appear to be forms in the life history of a species of Trematoda. The authorities treating of these creatures at my command are so meager that I can not speak with much definiteness as to their place or feel at all sure that they are not very well known species. At any rate, I have thought it worth while to present such observations as I have made, hoping they may prove of some slight use to others more favorably situated. In a majority of the crays examined in the fall and spring I have found a minute curved sack lodged in the gills, or still more abundantly in the muscles about the stomach. (Figs. 1, 2, 3.) Its length varies from .033 inch to .034 inch, the width from .0014 inch to .002 inch. The structure of these objects appears to be a delicate inner sack with granular contents, contained in a thick, double-walled outer tunic. At one, or both extremities, also, apparently, at other places in some examples, there are tubular passages from the inner sack through the outer. No change of form or motion has been observed, except in a few instances I have found the outer sack ruptured at one end and empty. Sometimes the inner sack appears without the other; in one instance the two were found side by side. (Figs. 4, 5.) I am not able to say whether, or not, these separations

resulted from accidental pressure. I have found them during the fall, winter, and spring; many crays were dissected during July last, but none were found to contain the parasite.



The other form occurs in the liver, and is a sexually immature *Distoma* or tailless *Cercaria*. The cysts are smooth, white, spherical, egg-like bodies .055 of an inch in diameter. It is sometimes so numerous that the ample liver of the host is packed full of them. In one example I estimated that there were more than two hundred of the cysts. Under the dissecting microscope it is easy to remove the thick outer coat, when the worm remains in a delicate investing sheath. After it is set free it glides about in the compressorium as a flat, broadly-oval worm. The anterior sucker is small; so likewise is the ventral one, which is placed near the center of the body. The short œsophagus divides into two cœcal-like branches or stomachs, which extend down either side nearly as far as the ventral sucker. They have been found in nearly half the crays examined in the fall. I have seen them in June. Recent attempts to find them failed.